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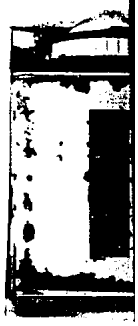

HIGH-FREQUENCY HEATING IN USSR FOOD CANNING

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Canning is one of the best methods of preserving food products. Our food industry produces more than 500 brands of canned meats, fish, vegetables, fruits, dairy products, and dietetic foods, supplying the population with high-quality food commodities and conserving the costly but perishable raw food materials (fruits, fish, and others). The presently utilized method of canning food has the following undesirable characteristics: in the process of sterilization, the products are subjected to protracted heating, up to 100 degrees and higher, as a result of which some of the products are cooked to a pulp, are discolored, and lose some of their flavor and nutritive value.

Sterilization by this method is done in autoclaves, huge steel vessels into which thousands of sealed containers of canned food are placed simultaneously. Water and then heating steam (in the event that the food is packed in glass jars), or only steam (if the containers are made of tin), is added to the autoclave, and the heating begins, which may last only a few tenths of a minute or as long as 3 or 4 hours, depending on the number of containers, their thermal conductivity, and also the thermal conductivity of the product. Of course, the product is not heated uniformly by this method: the heating is faster at the wall of the container and slower at its center. As a result, the product is boiled to a pulp in those parts of the container where it is exposed to more prolonged action of the heat.

Not long ago, members of the Scientific Research Institute of the Canning Industry solved the problem of speeding up the sterilization of canned foods, proposing that a high-frequency current be used for this purpose. It is known that nearly all food products are imperfect dielectrics, or semiconductors. For this reason, they are capable of heating up rapidly as a result of the action of a high-frequency field. The experiments showed that by a suitable selection of the conditions of high-frequency sterilization, the canned food, processed by the new method, is heated at least ten times faster than during treatment in the autoclave. Heating by this method proceeds uniformly, because the heat is generated directly in the products through which the high-frequency current is passed.

It has been determined, to give an example, that in an electric field having a frequency of 10 Mc and a potential that is not dangerous from the standpoint of the electric stability of the materials, the majority of food products are heated at the rate of 20 to 120 degrees per minute. Thus, not more than 35 to 140 seconds are needed for sterilizing the products. The quality of the canned food was sharply improved by reason of this markedly shortened time of sterilization. It was possible to produce canned, stewed fruit from such tender berries as raspberries and strawberries, which is something that could not be accomplished earlier because of the protracted heating in the autoclave.

The new method of sterilization permits the easy organization of continuous production lines, maximum automatization of the technological process, control of the heating of the product, and also significantly improves the working conditions in the canning factories. The first USSR production line of this type has already been designed and prepared for experimental operation by the Collective of the Scientific Research Institute of the Canning Industry. It is intended for the production of canned berries.

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Widespread introduction of high-frequency sterilization in the canning industry will permit us to produce a higher quality and a greater quantity of canned foods, making these foods a mass product for popular consumption.

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